WHAT IS CLAIMED IS:

SUB A4

1. A linear motor, comprising a movable unit in cylindrical shape having central axis at the intersection of X-axis and Y-axis, an inner yoke arranged on inner side of the movable unit with a given spacing in radial direction of the movable unit and being formed by laminating a multiple of thin plates each in approximately rectangular shape and having high magnetic permeability in parallel to one of X-axis or Y-axis, an outer yoke arranged on outer side of the movable unit with a given spacing in radial direction of the movable unit, being formed by laminating a multiple of thin plates each in approximately rectangular shape and having high magnetic permeability arranged in the same direction as the thin plates of the inner yoke, and forming a first magnetic pole, a second magnetic pole, and a third magnetic pole by arranging two slots cut out in the laminating direction of the thin plates, a coil wound on the second magnetic pole of the outer yoke and for forming alternately different magnetic poles at the first magnetic pole, the second magnetic pole, and the third magnetic pole, a base for retaining the inner yoke and the outer yoke, bearings mounted on the base to be positioned at the center of X-axis and Y-axis, a pair of permanent magnets magnetized in a direction to connect the inner yoke with the outer yoke and arranged on the movable unit to be retained in a gap between the inner yoke and the outer yoke with a given spacing in parallel to the central axis so that directions of magnetization are opposite to each other, and a shaft integrated with the movable unit and pivotally supported on the bearings.

2. A linear motor according to claim 1, wherein a pair of permanent magnets magnetized in radial direction around the central axis are arranged with a given spacing in parallel to the central axis so that directions of magnetization are opposite

to each other, and said magnets being retained in a gap between the inner yoke and the outer yoke.

Sub A4 Cncl'd.

3. A linear motor according to claim 1 or 2, wherein the inner yoke is formed by laminating a multiple of thin plates of the same shape and the same dimension, and the outer yoke is formed by laminating a multiple of thin plates of the same shape and the same dimension.

4. A linear motor according to claim 1 or 2, wherein radius of curvature of inner periphery of the outer yoke is equal to radius of curvature of inner periphery of the slot, and radius of curvature of outer periphery of the outer yoke is equal to radius of curvature of outer periphery of the slot, and radius of curvature of outer periphery of the outer yoke or the slot is greater than the radius of curvature of the inner periphery of the outer yoke or the slot.

5. A linear motor according to claim 2, wherein outer peripheral end of each of the outermost sides in laminating direction of the thin plates of the inner yoke and an end surface of the permanent magnet are on a line, which connects inner peripheral end of each of the outermost sides in laminating direction of the thin plates of the outer yoke with the intersection of X-axis and Y-axis.

6. A linear motor according to claim 1 or 2, wherein two inner yokes are arranged symmetrically with respect to Y-axis, and the two inner yokes are integrated by two inner yoke support members disposed inside the inner yoke and positioned separately in direction of Y-axis.

7. A linear motor according to claim 6, wherein the inner yoke support members are made of a nonmagnetic material.

8. A linear motor according to claim 1 or 2, wherein two outer yokes are arranged symmetrically with respect to Y-axis, and the two outer yokes are integrated by two outer yoke support members disposed on each of the outermost sides in laminating direction of the thin plates of the outer yokes.

9. A linear motor according to claim 8, wherein said outer yoke support members are made of a nonmagnetic material.

10. A linear compressor, comprising a movable unit in cylindrical shape and having the central axis at the intersection of X-axis and Y-axis, an inner yoke arranged on inner side of the movable unit with a given spacing in radial direction of the movable unit and being formed by laminating a multiple of thin plates each in approximately rectangular shape and having high magnetic permeability arranged in parallel to one of X-axis or Y-axis, an outer yoke arranged on outer side of the movable unit with a given spacing in radial direction of the movable unit, being formed by laminating a multiple of thin plates each in approximately rectangular shape and having high magnetic permeability arranged in the same direction as the thin plates of the inner yoke, and forming a first magnetic pole, a second magnetic pole and a third magnetic pole by arranging two slots cut out in the laminating direction of the thin plates, a coil wound on the second magnetic pole of the outer yoke and forming alternately different magnetic poles at the first magnetic pole, the second magnetic pole and the third magnetic pole, a base in planar shape for

retaining the inner yoke and the outer yoke, a cylinder mounted on the base to be positioned at the center of X-axis and Y-axis, a pair of permanent magnets magnetized in a direction to connect the inner yoke with the outer yoke and mounted on the movable unit to be retained in a gap between the inner yoke and the outer yoke with a given spacing in parallel to the central axis so that directions of magnetization are opposite to each other, a piston mounted at forward end of a shaft integrated with the movable unit and placed in the cylinder, and a spring mounted on the shaft.

SUB A5 cont'd.

Add A6